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IS 3013 (1991): Ferroboron [MTD 5: Ferro Alloys]

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भारतीय मानक

फेरोबोरॉन — विशिष्टि

(तीसरा पुनरीक्षण)

Indian Standard

FERROBORON — SPECIFICATION

(Third Revision)

UDC 669·15'781-198

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1991 Price Group 1

Ferroalloys Sectional Committee, MTD 05

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Ferroalloys Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first issued in 1965 and was subsequently revised in 1972 and 1980. In view of the experience gained during these years it was felt necessary to revise this standard. The following main modifications have been made in this revision:

a) Provision for particle size range has been made.

b) Clauses pertaining to chemical analysis and packing have been modified. Information to be given while ordering the material has been incorporated for the benefit of the purchaser.

c) New clauses have also been incorporated to avoid wide segregation of the chemical constituents, thereby safeguarding the interests of small consumers of this product.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

FERROBORON — SPECIFICATION

(Third Revision)

1 SCOPE

This standard covers the requirements of ferroboron used in ferrous industry.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
1387 : 1967	General requirements for the supply of metallurgical materials (*revised*)
1472 : 1977	Methods of sampling ferroalloys for determination of chemical composition (*first revision*)
3295 (Part 1) : 1969	Methods of chemical analysis of ferroboron : Part 1 Analysis of carbon, silicon and aluminium
3295 (Part 2) : 1970	Methods of chemical analysis of Ferroboron : Part 2 Determination of boron

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Cast (Melt)

The product of any of the following:

a) one furnace heat, or

b) one tap of continuous furnace, or

c) a number of furnace or crucible heats of similar composition mixed in a ladle or holding furnace and used for making a cast.

3.2 Consignments

3.2.1 *Tapped Lot Method*

A consignment constituted by the tapped lot method consists of a ferroboron mass of one melt (or one part of a continuous tap).

3.2.2 *Graded Lot Method*

A consignment constituted by the graded lot method consists of a number of melts (or parts of continuous taps) of one ferroboron designation. The boron content of the melts (or parts of continuous taps) constituting the consignment shall not differ from each other by more than 3 percent absolute.

3.2.3 *Blended Lot Method*

A consignment constituted by the blended lot method consists of a number of melts (or parts of continuous taps) of one ferroboron designation, which have been crushed to a particle size less than 50 mm and thoroughly mixed.

The content of the main constituent of the melts (or parts of continuous taps) constituting the consignment may vary between the minimum and maximum limits specified for the appropriate ferroboron designation.

4 DEFINITION

A master alloy of iron and boron with a minimum 10 percent content of boron by mass fraction, with limited amount of silicon and aluminium.

5 GRADES

This standard covers six grades of ferroboron as specified in Table 1.

6 PARTICULARS TO BE SPECIFIED WHILE ORDERING

For the benefit of the purchaser, particulars to be specified while ordering for the material to this specification shall be as follows:

a) quantity of the material;

b) constitution of consignment;

c) name of the material;

d) grade;

e) size range; and

f) necessary requirements for analysis, and reports, packing, etc, as appropriate.

7 SUPPLY OF MATERIALS

General requirements relating to supply of the material to this specification shall be as laid down in IS 1387 : 1967.

8 REQUIREMENTS

8.1 Consignment

Ferroboron shall be delivered in consignments constituted by one of the methods (*see* 3.2.1, 3.2.2 and 3.2.3).

8.2 Chemical Composition

8.2.1 Each batch of the material shall conform to the requirements of the chemical composition specified in Table 1 and if so specified by the purchaser at the time of enquiry and order manufacturer, shall supply a test certificate of chemical analysis of the sample of material for each melt.

NOTE — The material, belonging to a cast/melt which is not conforming to specification, shall not be blended or mixed with the material of another cast/melt.

8.2.2 If specified by the purchaser at the time of enquiry and order that each lump of the consignment should conform to the chemical composition specified in Table 1, this shall be agreed to between the purchaser and the manufacturer.

8.2.3 The chemical composition given in Table 1 shows only the main constituent elements and usual impurities. If the purchaser requires closer ranges for the main element contents and/or different limits for specified elements and/or non-specified elements, this shall be agreed to between the purchaser and the manufacturer.

8.2.4 The chemical composition of the material shall be determined by the method specified in IS 3295 (Part 1) : 1969 and IS : 3295 (Part 2) : 1970. In case of dispute the procedure given in the latest version of IS 3295 shall be the referee method. However, where the method is not given in IS 3295, the referee method shall be agreed to between the purchaser and the manufacturer.

9 SIZE RANGE

9.1 The material shall be supplied in lumps or as crushed and screened particles. The particle size ranges and tolerances shall be as given in Table 2. The undersize values shall be valid at the point of delivery to the purchaser.

9.2 If the purchaser requires particular size range and/or tolerance other than those given in Table 2, it shall be as agreed upon between the manufacturer and the purchaser.

Table 2 Particle Size Range

Size Designation	Size Range mm	Undersize, Percent by Mass, *Max*
(1)	(2)	(3)
1	2-50	3
2	2-25	5
3	Up to 2	—

NOTE — Undersize shall not include dust (less than —2 mm) for size designation 1 and 2.

10 EXTRANEOUS CONTAMINATIONS

The material shall be reasonably free from extraneous contaminations like slag and non-metallic inclusions, etc.

11 SAMPLING

Each batch of the material shall be sampled in accordance with IS 1472 : 1977.

12 PACKING

The material shall be packed in suitable containers, in quantities as mutually agreed to between the supplier and the purchaser.

13 MARKING

13.1 Each container shall be marked with the following:

a) Supplier's name or trade-mark;
b) Grade, cast or lot number and size designation;
c) Quantity;
d) Date of manufacture; and
e) Shelf life, if required.

13.2 The container may also be marked with the Standard Mark.

Table 1 Chemical Composition of Ferroboron
(*Clauses* 5, 8.2.1, 8.2.2 *and* 8.2.3)

Grade	Percent					
	B			C *Max*	Si *Max*	Al *Max*
	From	Over	Up to and Including			
High Carbon Ferroboron						
2 FeB 12	10·0	—	15·0	2·0	4·0	0·50
2 FeB 17	—	15·0	20·0	2·0	4·0	0·50
2 FeB 20	—	20·0	—	2·0	4·0	0·50
Low Carbon Ferroboron						
05 FeB 16	15·0	—	17·0	0·50	4·0	6·0
05 FeB 18	—	17·0	19·0	0·50	4·0	6·0
05 FeB 20	—	19·0	—	0·50	4·0	6·0

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	53 38 43
Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113	235 02 16
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